

Date: Thursday, 3/22/2007 7:46:27 AM
 User: Kim Johnston

Process Sheet

Customer	CU-DAR001 Dart Helicopters Services	Drawing Name	X-TUBE 412
Job Number	31434		
Estimate Number	12783		
P.O. Number	N/A	Part Number	D412664145
This Issue	3/22/2007	S.O. No.	N/A
Prsht Rev.	NC	Drawing Number	D412-664-145 U/R
First Issue	N/A	Project Number	N/A
Previous Run	31152	Drawing Revision	U/R
Written By		Material	N/A
Checked & Approved By	<u>SP 07.03.22</u>	Due Date	3/29/2007
Comment	Est Rev:A New Issue 07-02-14 JLM	Qty:	1
Um:	Each		

Additional Product

Job Number:



Seq. #	Machine Or Operation:	Description :	
1.0	DC	DOCUMENT CONTROL	
		Comment: Photocopy bluefile & type labels per PPPD412-664-105	CHG 001
2.0	D6019128	Crosstube Material	
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)	
		Pick: Qty Part number Description Batch	
		1 D6019-128 Crosstube <u>29369</u>	
		Check OD = 2.7500"; ID = <u>2.125"</u> <u>SP 07.03.22</u>	M8 07/03/22
3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: MORI SEIKI CNC LATHE LARGE	
		Turn as per Dwg D412-664-145	M8 07/03/22
4.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE	
		Comment: INSPECT PARTS AS THEY COME OFF MACHINE	M8 07/03/22
5.0	QC8	SECOND CHECK	
		Comment: SECOND CHECK	M8 07/03/27
6.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1	
		Comment: LANDING GEAR RESOURCE 1	
		1-Polish entire outside surface of crosstube	JB 7-4-4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

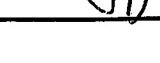
QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Job Number: 31434		Part Number: D412664145
Job Number:		
Seq. #	Machine Or Operation:	Description :
7.0	QC5	INSPECT WORK TO CURRENT STEP  
8.0	HAND FINISHING1	Comment: INSPECT WORK TO CURRENT STEP HAND FINISHING RESOURCE #1  
9.0	QC3/5	Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1 INSPECT WORK/WING WALK  
10.0	BENDING	Comment: Inspect work & Chemical conversion Coat BENDING MACHINE  
11.0	QC5	Comment: BENDING MACHINE Bend tube as per Dwg D412-664-145 using CNC bender program DIMENSIONAL CHECK  
12.0	LANDING GEAR 1	Comment: DIMENSIONAL CHECK LANDING GEAR RESOURCE 1  
13.0	HAND FINISHING1	Comment: LANDING GEAR RESOURCE 1 1-Drill pilot holes in tube as per Dwg D412-664-245 2-Ream hole to finish size in tube as per Dwg D412-664-245 3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-245 HAND FINISHING RESOURCE #1  
14.0		Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat Tube as per QSI 005 4.1 

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
/							

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

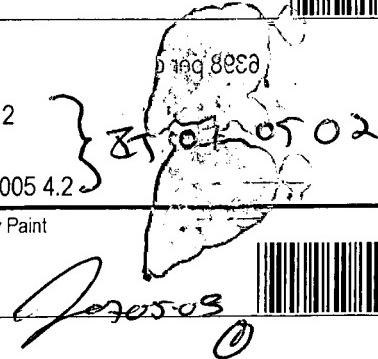
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Job Number: 31434		Part Number: D412664145
Job Number:		
Seq. #:	Machine Or Operation:	Description :
14.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION <i>070425</i>
15.0	QC5	INSPECT WORK TO CURRENT STEP <i>070425</i>
Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION		
Comment: INSPECT WORK TO CURRENT STEP		
16.0	OUTSIDE SERVICE	OUTSIDE SERVICES 
Comment: Sub-Contracting OUTSIDE SERVICES Liquid Penetrant Inspection as per QSI 038Or Issue P/O: <u>3644</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order <i>c207104/24 ①</i>		
17.0	PACKAGING 1	PACKAGING RESOURCE #1 
Comment: PACKAGING RESOURCE #1 Inspect for transit damage Ensure copy of NDT results attached to work order. <i>070501 ①</i>		
18.0	QC5	INSPECT WORK TO CURRENT STEP   
Comment: Inspect for damage & ensure results are as per Dwg D412-664-203 <i>070501 ①</i>		
19.0	SPRAY PAINTING	SPRAY PAINTING 
Comment: SPRAY PAINTING 1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 <i>070502 ②</i>		
20.0	QC14	Inspect Spray Paint  
Comment: Inspect Spray Paint Wrap in plastic bag to protect from scratches <i>070503 ③</i>		

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
070502	18.	No NDT results came back, waiting for Health Av. continue to step 27, - not 28. Tube was accepted at NDT rec'd 070504 11:30	J	070502	1	070502	070502
						8	

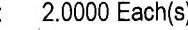
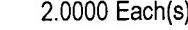
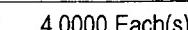
Part No: 11 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Job Number: 31434		Part Number: D412664145
Job Number:		
Seq. #:	Machine Or Operation:	Description :
21.0	D31893	Chafing Shield 
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Chafing Shield Batch: 31959 <i>RT 07 05 04</i>
22.0	D3595	Rubber Cushion (per sq ft) 
		Comment: Qty.: 0.0798 sf(s)/Unit Total : 0.0798 sf(s) Rubber Cushion Cut to .630" X 4.4" X 4 PCS Batch: A31948 <i>RT 07 05 04</i>
23.0	D28931	Support 
		Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s) Pick:  Qty Part number Description Batch 2 D2893-1 Support 27475 RT 07-09-04
24.0	D2856600	Abrasion Strip 
		Comment: Qty.: 0.9450 f(s)/Unit Total : 0.9450 f(s) Abrasion Strip 1X D2856 .250" X 8.42" Batch: 26690 <i>RT 07 -05 -04</i>
25.0	MS2192024	Clamp(per MIL-DTL-8783C) 
		Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s) Pick:  Qty Part number Description Batch 2 MS21920-24 Clamp 103002 <i>RT 07 -05 -04</i>
26.0	MS2192024	Clamp(per MIL-DTL-8783C) 
		Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  clamp(per MIL-DTL-8783C) batch: m 103002 <i>RT 07 05 04</i>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA:  Date: 07/05/04
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Date: Thursday, 3/22/2007 7:46:27 AM
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Process Sheet

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Job Number: 31434		Part Number: D412664145
Job Number: 		
Seq. #:	Machine Or Operation:	Description :
27.0	LANDING GEAR 1 	LANDING GEAR RESOURCE 1 
<p>Comment: LANDING GEAR RESOURCE 1 Assemble as per Dwg D412-664-145</p> <p>Install Chaffing Shield</p> <p>Instal supports with magnobond 6398 per dwg D412-664-245, cure for 12hrs before packaging.</p> <p>Time & date of application: <u>BT</u> 07 05 03 Batch: m103628</p> <p>12:00</p> <p>12:00 07 05 03</p> <p>27 07 05 03</p>		
28.0	QC5 	INSPECT WORK TO CURRENT STEP  
29.0	PACKAGING 1 	PACKAGING RESOURCE #1 
<p>Comment: PACKAGING RESOURCE #1 Identify and pack for shipping as per PPP D412-664-105</p> <p>*****Ensure tube is not packaged if curing time is less than 12 hrs, see step 26 for application time & date</p> <p>*****</p> <p>Time & date of packaging: <u>07-05-04</u> 12:30 , POSITIVE RECALL EFFECTIVE <u>07-03-22</u> AUTH <u>GP</u></p> <p>Location: _____ PPP Rev: <u>PPP 32107 S0</u> RELEASED <u>4/1</u> DATE <u>07-05-04</u></p> <p>27/5/04</p>		
30.0	QC21 	FINAL INSPECTION/W/O RELEASE  
<p>Comment: FINAL INSPECTION/W/O RELEASE <u>NOTOKTOY</u></p>		
Job Completion 		

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART

DESIGN <i>QP</i>	DRAWN BY <i>QP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>A</i>	APPROVED <i>MM</i>	DRAWING NO. D412-664-145	REV. B SHEET 1 OF 3
DATE 07.03.01		TITLE CROSSTUBE ASS'Y (412 LOW-N FWD) NTS	SCALE
A	06.12.21	NEW ISSUE	
B	07.03.01	CHG RUBBER CUSHION	

PRELIMINARY ISSUE**PARTS LIST:**

Qty	Part Number	Description
X	D412-664-145	CROSSTUBE ASSEMBLY (412 LOW-NARROW FWD)
1	D6019-128	CROSSTUBE
1	D2856-250-842	ABRASION STRIP
2	D2893-1	SUPPORT
1	D3189-3	CHAFING SHIELD
4	D3595-063-440	RUBBER CUSHION
2	MS21920-22	CLAMP
4	MS21920-24	CLAMP
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6019-128
FINISHED LENGTH = 124.48 ± 0.020 (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR MS21920-22 CLAMPS AND ASSOCIATED HARDWARE.
- 5) RUN-OFF PART: BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-XXX-YYY ABRASION STRIPS WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER COPY INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-24 CLAMPS WITH D3595-063-440 RUBBER CUSHIONS TO SECURE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.

RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 31434

DART AEROSPACE LTD

Work Order:

Description: (crosslube) 4112 Low Narrow FWD

Part Number: D4112-664-145

Inspection Dwg:D4112-664-145 Rev: B

Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST



First Article



Prototype

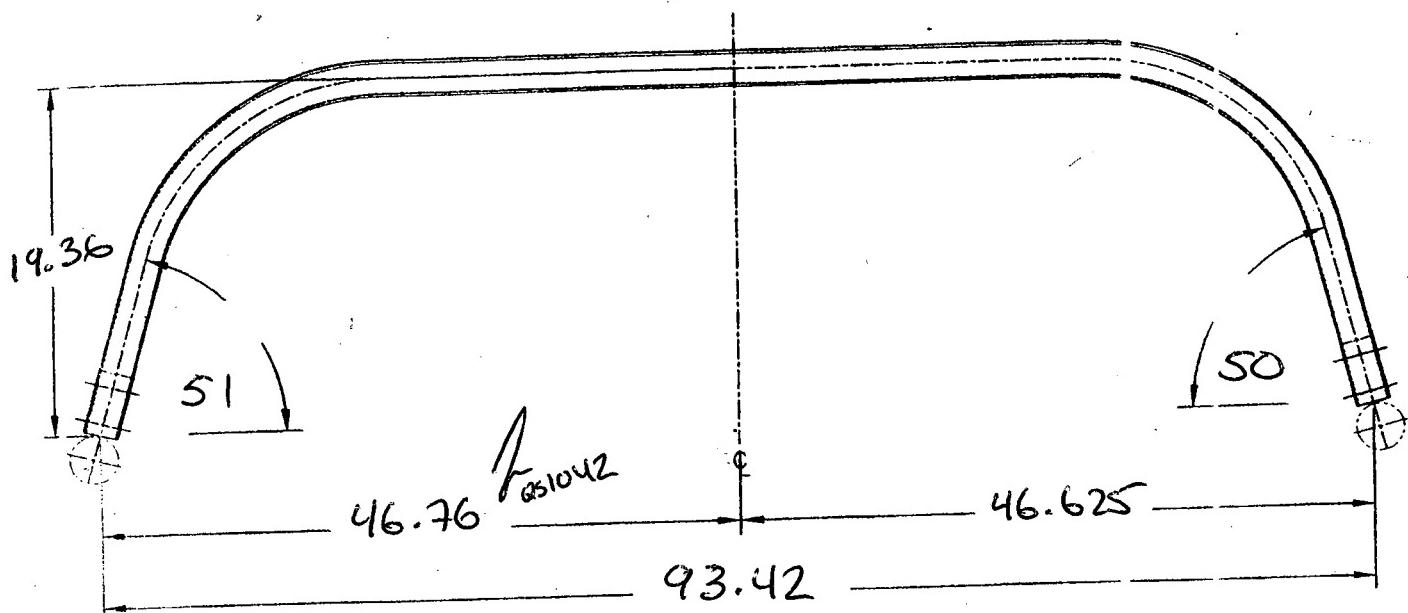
Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
A 2.740	+ .005 -.000	2.744	✓			
B 2.490	"	2.493	✓			
C 2.557	"	2.561	✓			
D 2.624	"	2.628	✓			
E 2.692	"	2.696	✓			
F 2.750	"	2.751	✓			
G 124.48	± .020	124.48	✓			
H						
I						
J						
K						
L						
M						
N 2.740	+ .005 -.000	2.743	✓			
O 2.490	"	2.493	✓			
P 2.557	"	2.560	✓			
Q 2.624	"	2.628	✓			
R 2.692	"	2.696	✓			
S 2.750	"	2.751	✓			
T						
U						
V						
W						
X						
Y						

Measured by:	MJS	Audited by:	gml	Prototype Approval:	N/A
Date:	07/03/22	Date:	07/03/22	Date:	N/A

Rev	Date	Change	Revised by	Approved
		New Issue	KJ/RF	

DART AEROSPACE LTD**Work Order****31434****-145****Description:** Crosstube Low Narrow Aft (412)**Part Number:****D412-664-~~245~~****-145****Inspection Dwg:** D412-664-~~245~~**Rev: B****Page 1 of 1**

Required Dimension	Min	Max
Height	19.33	19.49
1/2 Span	46.47	46.73
Angle	49	52
Total Span	92.94	93.46

1**1****Comments****QC15 Inspection**
Date**07.04.12**

Rev	Date	Change	Revised by	Approved
A	07.03.29	New Issue	KJ. M	/



HeathAir
INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3
Tel.: (514) 636-1000 • Fax: (514) 636-0031

W.O. № 36257

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

AIRCRAFT / COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

INSPECTION REQUIREMENTS

Carry out FPI of (13) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.I.1 (on file at client) - parts delivered to HeathAir.

Qty (1) P/N D058-676-101	S/N B30250.	Qty(2) P/N D206-667-103	S/N's B30429 and B28979.
Qty (1) P/N D206-667-203	S/N B29635.	Qty(1) P/N D206-667-201	S/N B29098.
Qty (2) P/N D412-664-245	S/N's B31600 and B31598.		
Qty (2) P/N D412-664-145	S/N's B31434 and B31152.		
Qty (4) P/N D206-667-101	S/N's B30438, B28680, B29101 and B29099.		

RADIOGRAPHY

ULTRASONIC

PENETRANT

MAGNETIC PARTICLE

EDDY CURRENT

INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on (13) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)
Ardrox 970P25E Batch #04B503.

(13) cross tubes inspected. (10) PASSED / (3) FAILED.

Note: Failed items were serial numbers from above - B30250, B28680 and B29101.
- tubes were marked in areas requiring rework.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY:

DATE

April 27, 2007.

INSPECTION
STAMP(S)

CUSTOMER INFORMATION

CUSTOMER: Dart Aerospace

P.O. NUMBER PO 00003644

ADDRESS: fax to 613-632-1053

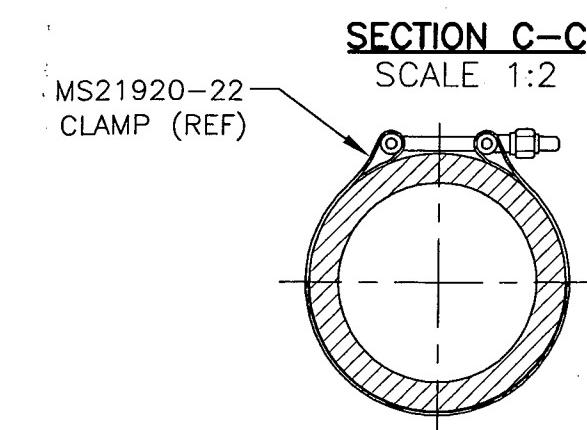
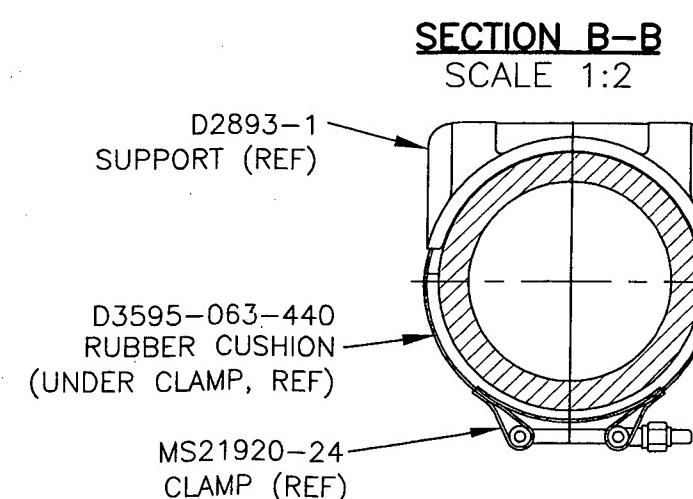
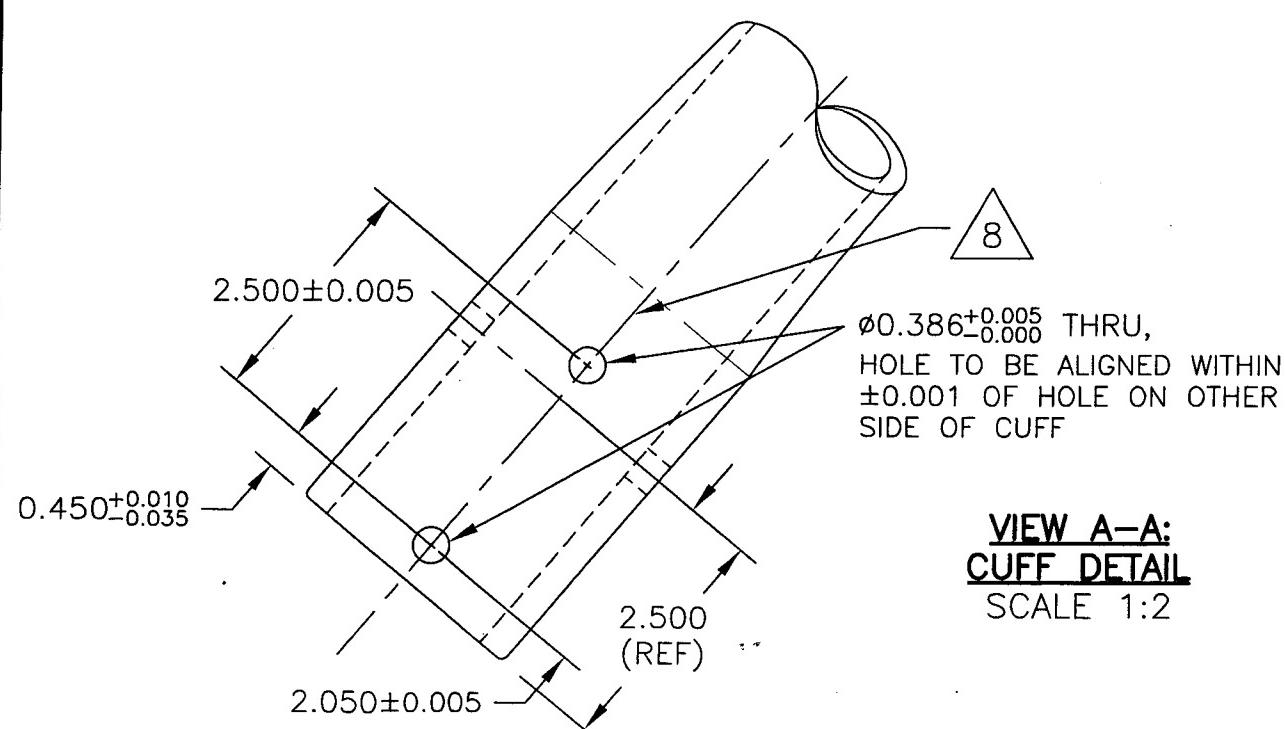
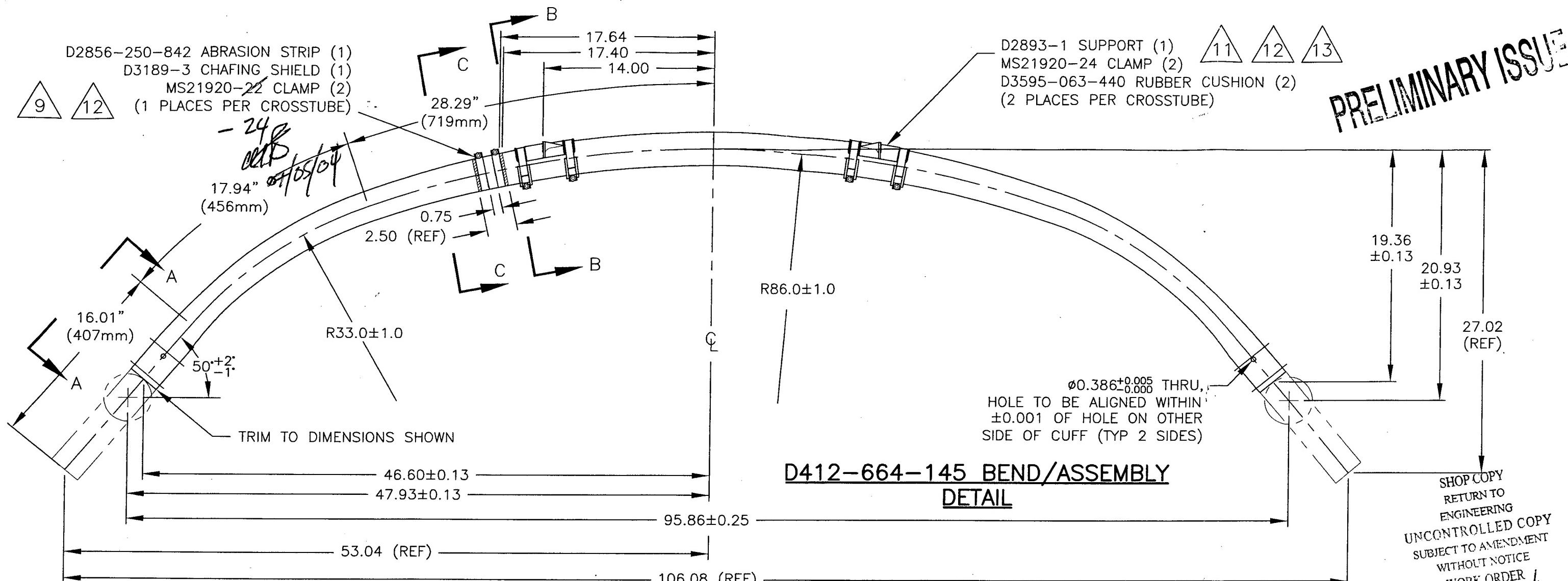
CONTACT NAME Linda Lacelle

LABOUR	②	\$
MATERIALS	②	GST
TRAVEL EXPENSES	②	PST
HOTEL EXPENSES	②	

INVOICE NO.

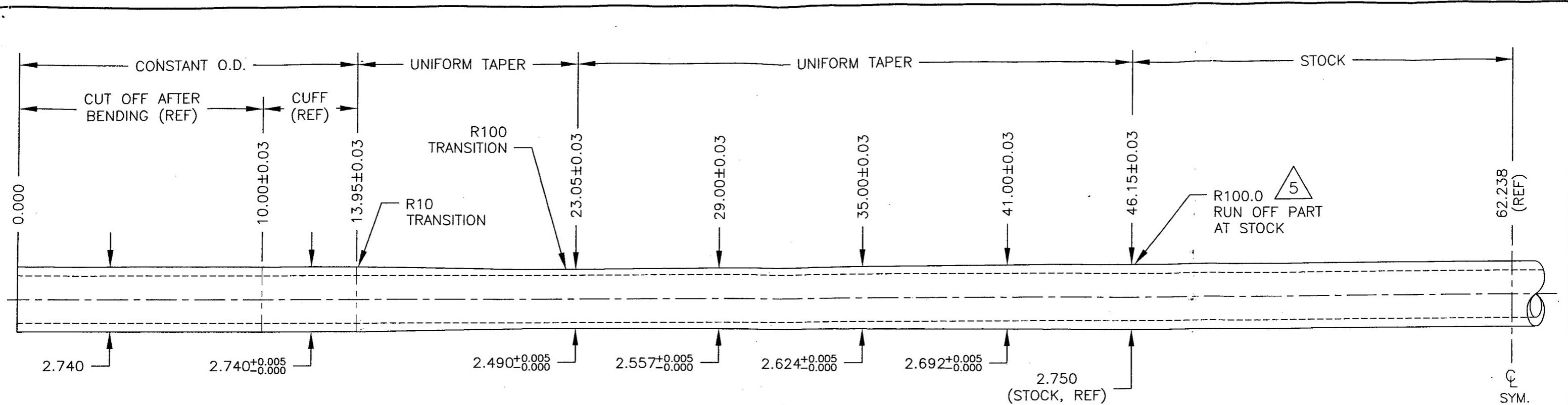
TOTAL \$

PRELIMINARY ISSUE



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THAT IT IS NOT TO BE USED FOR ANY PURPOSE
OR COPIED OR COMMUNICATED TO ANY OTHER
PERSON WITHOUT WRITTEN PERMISSION FROM
DART AEROSPACE LTD.

DESIGN	gp	DRAWN BY	gp	DART	DART AEROSPACE LTD. HAWKSBURY, ONTARIO, CANADA
CHECKED	<i>[Signature]</i>	APPROVED	<i>[Signature]</i>	DRAWING NO.	D412-664-145
DATE	07.03.01	TITLE	CROSSTUBE (412 LOW-NARROW FWD)	REV. B	SHEET 2 OF 3
		SCALE	1:8		



D412-664-145 MACHINING DETAIL

PRELIMINARY ISSUE

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 31434

COPYRIGHT © 2006 BY DART AEROSPACE LTD.		DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED				DRAWING NO. D412-664-145 REV. B SHEET 3 OF 3
DATE		07.03.01			SCALE CROSSTUBE (412 LOW-NARROW FWD) 1:4